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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,536	03/04/2002	Ken Veitch	00495-0002	1050
7590	05/16/2005		EXAMINER	
Orange & Chari 66 Wellington Street West, Suite 4900 Toronto, ON M5K 1H6 CANADA			BRINEY III, WALTER F	
			ART UNIT	PAPER NUMBER
			2644	
DATE MAILED: 05/16/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/086,536	VEITCH, KEN	
	Examiner	Art Unit	
	Walter F. Briney III	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 09 November 2004.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-3, 14, 19, 20 and 22-37 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-3, 14, 19, 20 and 22-37 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

In adding claims 19, 20 and 22-37, the applicant erred by skipping claim 21. It is noted that claim 21 does not exist on the record. For simplicity, claims 22-37 should maintain their current number designations.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 36 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claim 36 recites the limitation "the method of claim 37" in line 1 of the claim.

There is insufficient antecedent basis for this limitation in the claim. In addition, claim 37 recites the limitation "the method of claim 36" in line 1 of the claim. These recursive references make it impossible to determine the scope of the above claims. For the purposes of this action, claim 36 is assumed to depend on claim 35, in the same fashion that claim 28 depends on claim 27. This also mitigates the lack of antecedent basis found in claim 37.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Norrell et al. (US Patent Application Publication 2002/0106013).**

*Claim 1 is limited to a tie line adapter for communicating a signal from a first communication system to a second communication system.* Norrell discloses a loop extender with selectable line termination and equalization. See Abstract. As depicted in figure 5, and pursuant to the objectives of providing a reliable DSL repeater, Norrell includes a plurality of selectable output impedances (406a), (406b), (406c), (406d), (408a), (408b), (408c) and (408d); each impedance is suited to match a particular set of known telephone loop characteristics. In addition, the repeater is operable to amplify and filter, or equalize the respective upstream and downstream DSL transmissions using the variable elements (402a), (402b), (404a) and (404b). See paragraphs 11-16.

With particular respect to the current claim limitations of the application, the repeater, or so-called loop extender, of Norrell corresponds to the claimed *tie line adapter*. Clearly, the central office (202) and customer premises (204) correspond to the *first and second communication systems*, respectively. It follows that the transformers (418) and (420) can be respectively considered the *input point...from a first tie line of said first communication system* and the *output point...to a second tie line of said second communication system*. Downstream filter/amp elements (402a) and (402b) together correspond to the *first controller*, and are disclosed as providing proper

amplification and possible equalization necessary to mitigate the loss and possible distortion affected by transmission along line (214). See paragraph 53. As such, the downstream filter/amp *adjusts said signal to have an adjusted voltage characteristic substantially matching a tie line voltage characteristic of said second tie line*. Output impedances (408a), (408b), (408c) and (408d) then clearly correspond to the second controller. Norrell discloses that these impedances are selected to match the impedance of the line as seen at the output point, i.e. *transformer* (420). See paragraph 52, lines 21-28. Therefore, Norrell anticipates all limitations of the claim.

**Claim 14** is limited to a *method for communicating a signal from a first tie line to a second tie line*. The tie line adapter rejected in claim 1 over Norrell inherently performs the method steps of claim 14. Therefore, Norrell anticipates all limitations of the claim.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 19, 20, 22-24 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norrell et al. (US Patent Application Publication 2002/0106013) in view of Sheets et al. (US Patent 5,974,137).**

**Claim 19** is limited to *the line adapter of claim 1*, as covered by Norrell. As was shown in the rejection of claim 1, Norrell discloses a loop extender with selectable line termination and equalization. As seen from figure 5, the system of Norrell includes two filter/amp elements for each of the upstream and downstream transmission path. Again, the filter/amp corresponds to the *first controller*. However, Norrell only discloses that the filter/amp elements are selected based on the characteristics of each tie line associated with each of the two communication systems (202) and (204). See paragraph 53. Therefore, Norrell anticipates all limitations of the claim with the exception *wherein the first controller comprises a voltage divider for adjusting said signal.*

Because Norrell does not disclose the construction of these elements, one of ordinary skill in the art would be inherently motivated to find an enabling disclosure in order to implement the loop extender disclosed by Norrell. To this end, Sheets discloses a detailed schematic structure of an adjustable gain amplifier (68) and equalizer (70), which happen to be designed for use with a two-wire line conditioner (i.e. loop extender). See column 1, lines 7-31. As seen in figure 14, a variable gain amplifier (68) and equalizer (70) with selectable settings can be implemented using various stages of amplifiers and voltage divider networks (e.g. resistors 272, 274, 276, 278, 292, 294, and 296). In fact, this embodiment is suggested as beneficial by Norrell, who discloses in paragraph 59 that the filter/amplifier elements are to be configured to share components in order to reduce part count and reduce costs. By using the

selectable resistors of Sheets, a reduction in parts is gained because the need for two entirely separate filter/amplifier elements is eliminated.

It would have been obvious to one of ordinary skill in the art at the time of the invention to first, implement amplification and equalization using voltage dividers as taught by Sheets, simply because Norrell fails to disclose the structure of the filter/amplifier elements; and second, use adjustable resistors because they produce an economy of parts and reduce the overall cost of the loop extender.

**Claim 20** is limited to *the line adapter of claim 19*, as covered by Norrell in view of Sheets. As shown in the rejection of claim 19, the adjustable gain amplifier (68) and equalizer (70) of Sheets, which corresponds to the filter/amplifier element of Norrell -- and subsequently the *first controller* of the claim, include *selectable resistors* (272), (274), (276), (278), (292), (294) and (296). Each resistor is selectable by way of a corresponding FET as is clearly seen from the schematic figure 14 of Sheets.

Therefore, Norrell in view of Sheets makes obvious all limitations of the claim.

**Claim 22** is limited to *the line adapter of claim 20*, as covered by Norrell in view of Sheets. Although Sheets fails to disclose the particular values of each *selectable resistor* recited in the rejections of claims 19 and 20, their effects are known. Specifically, actuating FET (27) causes an attenuation of 0.5 dB to be applied to the incoming signal, likewise actuating FET (282) causes an attenuation of 1.0 dB to be applied to the incoming signal. Because all other elements remain of equal value, the difference in attenuation value can only be accounted for by the fact that each resistor

(272), (274), (276) and (278) must have a different resistance. Therefore, Norrell in view of Sheets makes obvious all limitations of the claim.

**Claim 23** is limited to *the line adapter of claim 19*, as covered by Norrell in view of Sheets. As seen in figure 14 of Sheets, the voltage divider chain of the equalizer (70) includes a biasing current source (306) that includes a PNP transistor that functions to provide a stabilized current. The transistor effectively acts as a *continuously variable resistor* under the influence of the supply voltages provided on either end of the voltage divider chain including the 3.01K $\Omega$  and 49.9K $\Omega$  resistors. Therefore, Norrell in view of Sheets makes obvious all limitations of the claim.

**Claim 24** is limited to *the line adapter of claim 19*, as covered by Norrell in view of Sheets. As shown in the rejection of claim 1, Norrell discloses a plurality of output impedance matching elements (408a), (408b), (408c) and (408d). Norrell further discloses that these matching elements are precisely matched to known subscriber loop configurations, in order to provide a close match to the impedance seen from transformer (420). See paragraph 52, lines 21-28. Again, however, Norrell fails to disclose the makeup of these elements. Therefore, Norrell in view of Sheets makes obvious all limitations of the claim with the exception *wherein each of said plurality of pre-configured impedance values is provided by a different resistive element*.

The examiner takes Official Notice of the fact that subscriber loops are dominated by resistive values (approximately 100 $\Omega$  at xDSL frequencies). In addition, it was known to implement impedance matching using resistive elements that approximate known impedance values of subscriber loops.

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement line matching using resistive components as was known in the art simply because Norrell fails to disclose the structure of the impedance elements and because loops are dominated by resistive values (as opposed to a purely reactive value) and require a resistive impedance to provide any type of close match.

**Claim 30** is limited to *the method of claim 14*, as covered by Norrell. The tie line adapter rejected in claim 19 over Norrell in view of Sheets inherently performs the method steps of claim 30. In particular, Sheets provides selectable resistors that apply particular amounts of attenuation to the input signal (i.e. *one of a plurality of pre-configured voltage levels*). Therefore, Norrell in view of Sheets makes obvious all limitations of the claim.

**Claims 31-34** are limited to methods whose steps are inherently performed by the tie line adapters of claims 20 and 22-24, respectively, and are rejected for the same reasons.

4. **Claims 2, 3, 25-29 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norrell et al. (US Patent Application Publication 2002/0106013) in view of Sheets et al. (US Patent 5,974,137) and further in view of Schwarzbard (US Patent Application Publication (2002/0080865).**

**Claim 25** is limited to *the line adapter of claim 24*, as covered by Norrell in view of Sheets. Norrell discloses that the loop extender of figure 5 can be modified to include a microprocessor that is responsive to voice frequency modem signals transmitted by the central office (202), and can control the operation of the loop extender circuitry.

While this corresponds to a *digital signal processor in communication with said input point*, the DCP (612) does not perform further adjusting of the signal processed by the SLTE DSL amplification circuitry, as seen in figure 6. Therefore, Norrell in view of Sheets makes obvious all limitations of the claim with the exception of a *digital signal processor...for further adjusting said signal.*

Schwarzband teaches a bidirectional signal repeater, which corresponds to the loop extender of Norrell. See Abstract of Schwarzband. As a goal of the invention, Schwarzband teaches improving the echo cancellation within a signal repeater. Pursuant to this end, Schwarzband includes in addition to hybrid units (100U) and (100D), which functionally correspond to the transformers and output impedance elements of Norrell, a digital echo canceller as depicted in figures 1 and 2. Schwarzband teaches that the echo canceller removes echo that results from a mismatch in termination impedances. So even though the impedances of Norrell provide a good match, it can never be a perfect match.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a digital echo canceller for further adjusting of said received signal as taught by Schwarzband for the purpose of reducing echo that results in a termination impedance mismatch provided by the hybrid circuitry of Norrell.

**Claim 26** is limited to *the line adapter of claim 25*, as covered by Norrell in view of Sheets and further in view of Schwarzband. As shown in the rejection of claim 25, the teachings of Schwarzband suggest including an *echo canceller* to remove unwanted echo resulting from a termination mismatch within the hybrid units. Therefore, Norrell in

view of Sheets and further in view of Schwarzbard makes obvious all limitations of the claim.

**Claim 27** is limited to *the line adapter of claim 26*, as covered by Norrell in view of Sheets and further in view of Schwarzbard. As shown in the rejection of claim 25, the teachings of Schwarzbard suggest including an *echo canceller* to remove unwanted echo resulting (i.e. *audio filtering*) from a termination mismatch within the hybrid units. Therefore, Norrell in view of Sheets and further in view of Schwarzbard makes obvious all limitations of the claim.

**Claim 28** is limited to *the line adapter of claim 27*, as covered by Norrell in view of Sheets and further in view of Schwarzbard. As seen from both figures 1 and 2, the input signal must be converted from the analog to digital domain in order for the digital echo canceller to affect echo cancellation. The conversion modules correspond to a *third controller*. Therefore, Norrell in view of Sheets and further in view of Schwarzbard makes obvious all limitations of the claim.

**Claim 2** is limited to *the line adapter of claim 28*, as covered by Norrell in view of Sheets and further in view of Schwarzbard. The presence of an upstream and downstream filter/amplifier element clearly indicates that the system of Norrell allows for transmitting and receiving between the central office (202) and the customer premises (204), that is, *bi-directional communication between said first communication system and second communication system*. Therefore, Norrell in view of Sheets and further in view of Schwarzbard makes obvious all limitations of the claim.

**Claim 3** is limited to *the line adapter of claim 28*, as covered by Norrell in view of Sheets and further in view of Schwarzbard. Each filter/amplifier element separately provides *uni-directional communication between the first and second communication systems*. Therefore, Norrell in view of Sheets and further in view of Schwarzbard makes obvious all limitations of the claim.

**Claim 29** is limited to *the line adapter of claims 2 or 3*, as covered by Norrell in view of Sheets and further in view of Schwarzbard. The telephone central office (202) has been equated to the *first communication system* while the customer premises equipment (204) has been equated with the *second communication system*. As both systems allow voice traffic and data to be communicated, they clearly correspond to intercom systems. Therefore, Norrell in view of Sheets and further in view of Schwarzbard makes obvious all limitations of the claim.

**Claims 35-37** are limited to methods whose steps are inherently performed by the tie line adapters of claims 25, 28 and 29, respectively, and are rejected for the same reasons.

### ***Response to Arguments***

Applicant's arguments filed 09 November 2004 with respect to claims 1-3, 14, 19, 20 and 22-37 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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5/9/05